



Forest Insect & Disease Management

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WHITE PINE BLISTER RUST EVALUATION GEORGE WASHINGTON NATIONAL FOREST, 1980

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ABSTRACT

During 1980, an evaluation of white pine blister rust was made on the George Washington National Forest to determine the incidence of white pine blister rust and the occurrence of Ribes near white pine on the Forest. Twelve stands, each containing 16 plots, were sampled at random. White pine blister rust was found on three trees in two plots. Ribes was found on one of the 192 plots examined. White pine blister rust incidence is very low on the George Washington National Forest; localized when present, and poses no general threat to the white pine forest resource. Management considerations are provided.

INTRODUCTION

Eastern white pine, Pinus strobus, is a tree of considerable economic and aesthetic value in landscape plantings and recreation areas in addition to being a highly valued timber species. The success of white pine can be attributed to an ability to thrive in a variety of forest conditions and to grow rapidly.

White pine blister rust, caused by Cronartium ribicola, has resulted in widespread damage to white pine throughout much of the eastern United States over the course of the century. Alternate hosts in the plant genus Ribes are required by Cronartium ribicola to complete its life cycle.

The fungal spores from infected Ribes enter white pine through the needles and eventually grow into the bark. Cankers are then formed which can migrate to the trunk and cause mortality.

For many years, Ribes eradication was viewed as the most effective of controlling white pine blister rust. As the incidence of blister rust decreased over the years, Ribes eradication was eventually stopped. Eradication on the George Washington National Forest ended in 1969.

The present evaluation was made in 1980 with the objectives of determining the current incidence of blister rust on white pine and the occurrence of Ribes around pine on the Forest. From the information obtained, conclusions can be drawn regarding the status of blister rust before and after eradication. Management considerations for future rust control practices can be made after considering the evaluation results and the economic value of white pine on the Forest.

METHODS

To evaluate white pine blister rust on the Forest, 12 stands were selected at random. The location of these stands are shown in figure 1. Each stand contained 16 plots, each of which had an area not less than 1/200 acre and not greater than 1/56 acre. In each plot, all trees with living branches within 3 feet of the ground were examined. If four trees which qualified for examination could not be found in the 1/200 acre plot, the plot was enlarged up to 1/56 acre until at least four trees were included. A total of 988 trees were examined on the 192 plots.

Disease condition data collected for each tree included the number of Ribes plants within 16 and 900 feet, presence or absence of rust infection and tree symptom class. Classification of symptoms refers to canker age and location (stem or branch) and the distance from branch cankers to the main stem. Other recorded data were tree age, dbh, (height if trees were less than 4.5 feet tall), crown class and stand origin (planted or natural).

A "yes" was recorded for infected white pines and a "no" was recorded for those trees not infected. Stem and branch cankers were recorded separately. The distance between branch cankers and the main stem was recorded, and the age of every canker was included in the data. The crown class of each tree was recorded as (1) dominant, (2) intermediate, or (3) suppressed, relative to the amount of overstory present. The age of each tree and the dbh of each tree taller than 4.5 feet was recorded.



George Washington National Forest

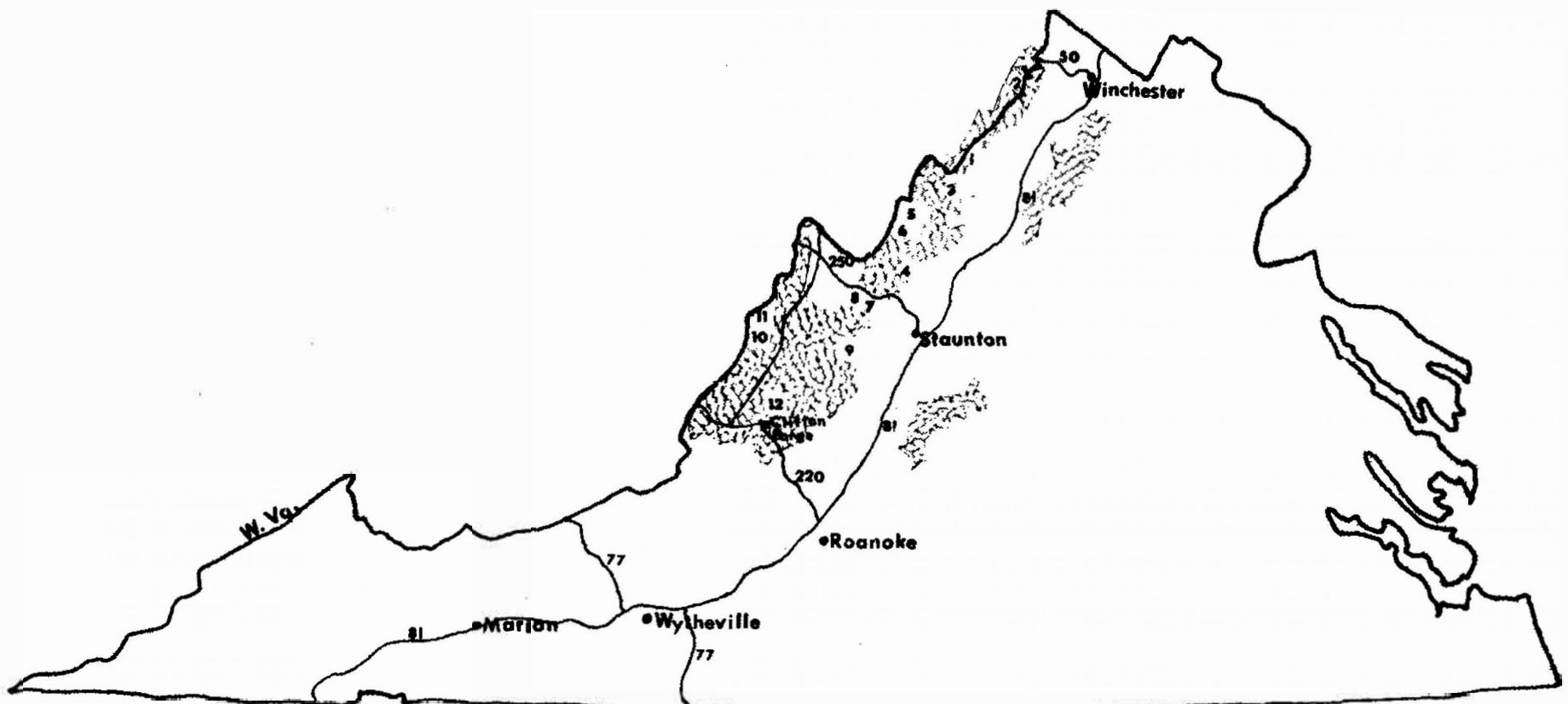


Figure 1.--Location of the white pine blister rust plots on the George Washington National Forest.

A height was recorded for trees shorter than 4.5 feet. Finally, the number of Ribes found within 16 feet of the tree and the number found within the area (900 ft.) of the tree was recorded. The stand origin was recorded as natural or planted.

RESULTS

The results of this evaluation are summarized in table 1. White pine blister rust was found on three trees in two plots. Ribes were found on one of the 192 plots. This represents a very low incidence of infection on the Forest. The extremely low rust incidence (.5%) detected during the present survey conforms very closely with results obtained by Cordell, et.al., 1969 from a similar survey of the Forest. About 94 percent of the 988 trees examined were in the suppressed crown class. The average dbh of all trees was 1.38 inches and the average age was 14.46 years. The average elevation of the grids was 2,242 feet.

CONCLUSIONS

The present incidence of white pine blister rust infection and the occurrence of Ribes on the George Washington National Forest is not high enough to justify altering normal overall forest management priorities. However, because of the white pine blister rust found in and around plots 11 and 12, the presence of rust on permanent plots setup in 1970 and state collected rust (Joel Artman, Virginia Division of Forestry) data, the areas in figure 2 are classified as rust hazard areas. Because of the potential hazard, establishment of high value stands, such as seed orchards, should be avoided in these areas.

MANAGEMENT CONSIDERATIONS

1. Practice normal eastern white pine forest management throughout the Forest.
2. Because of infection levels found in the areas in figure 2 (current and previous surveys), white pine blister rust could be serious enough to adversely affect high-value uses such as research plots, seed orchards, or Christmas trees.
3. Check for Ribes occurrence prior to planting in the rust hazard areas and contact Forest Pest Management for onsite evaluations if Ribes are found.
4. General Ribes eradication is not justified either biologically or economically at the present time on the Forest.

Table 1.--Occurrence of white pine blister rust on the George Washington National Forest, 1980.

Stand #	No.	Trees No.	% Infected	Crown Class						Average dbh		Average Age		Elevation in Feet
				No. Uninfected 1 3 3			No. Infected 1 2 3			Uninfected	Infected	Uninfected	Infected	
1	26		0	2	16	8	0	0	0	1.97	0	11.7	0	1500
	79		0	0	3	76	0	0	0	1.48	0	17.8	0	1500
	98		0	0	1	97	0	0	0	.66	0	14.2	0	1400-1200
	67		0	0	6	61	0	0	0	1.6	0	17.7	0	2300
	70		0	1	13	56	0	0	0	3.25	0	14.8	0	3500
	94		0	1	3	90	0	0	0	1.36	0	12.9	0	2400
	90		0	0	1	89	0	0	0	1.65	0	12.4	0	1800
	82		0	0	2	80	0	0	0	1.31	0	13.9	0	2200
	98		0	0	0	98	0	•	0	.90	0	16.7	0	2100
	104		0	0	0	104	0	0	0	.89	0	12.9	0	3000
	100		2	0	2	96	0	0	2	1.32	0.8	13.4	15.5	3200
	80		1.25	0	7	72	0	0	1	2.25	.6	15.1	20.0	2100
Total	988		3.25	4	54	927	0	0	3					
Percent	99.7		00.3	0.4	5.6	94			100					
Average										1.38	.7	14.46	17.75	2242

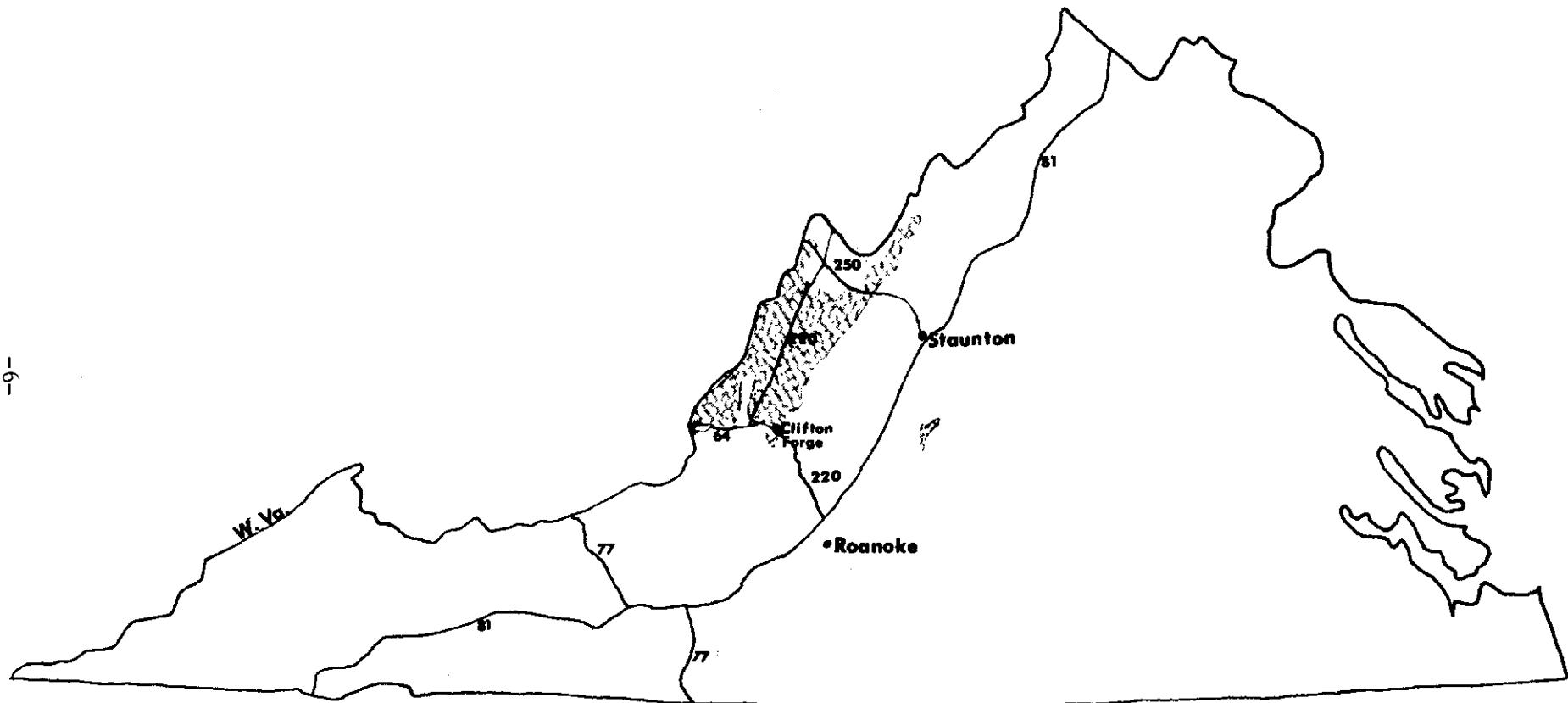


Figure 2.--Location of white pine blister rust hazard areas on the George Washington National Forest, 1980.